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QUICK CONNECT BLADE IRON SYSTEM

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REFERENCE TO RELATED APPLICATION

Applicant claims the benefit of U.S. Provisional Patent Application Serial No. 60/395,869 filed July 12, 2002 and entitled QUICK CONNECT BLADE AND BLADE IRON.

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TECHNICAL FIELD

This invention relates to ceiling blade irons, and especially to quick connecting blade irons.

BACKGROUND OF THE INVENTION

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Electrically powered ceiling fans typically have a motor mounted within a stationary housing that is suspended from a ceiling. In operation, the motor rotates an annular array of individual extensions in the form of blade irons. Each blade iron is associated with a blade mounted thereto.

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Ceiling fans are usually sold at retail with their blades packed separately from the blade irons and the blades packed separately from the motor for compactness. The housing is normally mounted in suspension from the ceiling through a downrod and then the blades are mounted to the blade irons and the blade irons are mounted to the motor.

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The blade irons of ceiling fan have typically been mounted to the motor by providing a mounting flange portion of the blade iron with mounting holes through which mounting screws are passed. These mounting screws are threaded into threaded mounting holes extending into the rotatably driven portion of the motor. This however has proven to be a tedious task for those installing the blade irons. Installers must align the holes of the mounting flange with those of the motor while simultaneously passing the screws through the flange mounting holes. This task is usually done while the blade iron is coupled to the blade, thus, the installer must also bear the weight of the blades during the mounting process.

Accordingly, it is seen that a need remains for a blade iron that can be quickly and easily mounted to an electric motor. It is to the provision of such therefore that the present invention is primarily directed.

SUMMARY OF THE INVENTION

In a preferred form of the invention a blade iron mounting system which is mounted to an electric motor comprises a blade iron having a blade mounting portion, and a motor mounting portion opposite the blade mounting portion, the motor mounting portion having a vertical portion extending to a horizontal portion, a pair of channels having a enlarged portion extending through the vertical portion and a narrow portion extending into the horizontal portion, and a releasable stop. The system also includes a pair of posts coupled to the motor, each post has a stem portion and a head portion, and spring biasing means for biasably coupling the blade iron to the posts. With this construction, the blade iron is moved in one direction to allow the posts to be slid through the

channels while the spring mean provides a tight fit between the posts and the mounting portion, and whereby the stops prevent the movement of the mounting portion in an opposite direction.

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BRIEF DESCRIPTION OF THE DRAWING

Fig. 1 is an exploded view of a portion of a ceiling fan motor, ceiling fan blade iron and ceiling fan blade embodying principles of the invention is a preferred form.

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Figs. 2- 4 are a series of perspective views of the ceiling fan blade iron and blade shown being connected to the motor portion.

Figs 5 and 6 are top views showing the ceiling fan blade iron connected to the motor portion.

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Fig. 7 is a top view of the ceiling fan blade iron connected to a blade.

DETAILED DESCRIPTION

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With reference next to the drawings, there is shown a quick connect blade iron system 10 in a preferred form of the invention. The blade iron system 10 is coupled to a conventional ceiling fan electric motor 11 having a lower portion 12. The motor lower portion 12 has an annular array of five, paired, internally threaded mounting holes 13 therein. A post or mounting screw 16, having a stem 17 and a head 18, is mounted within each mounting hole 13. Each post 16 passes through a S-shaped spring 19 having a first leg 21 adjacent the motor lower portion 12, a second leg 22 and a third leg 23. The first leg 21 is configured to include two L-shaped flanges which forms a releasable blade iron stop 24.

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The blade iron system 10 also includes a blade iron 27 having a motor mounting flange or portion 28 and a blade

mounting portion 29. The motor mounting portion 28 has a vertical portion or peripheral wall 31 extending to a horizontal portion or abutment wall 32 which abuts the motor lower portion 12. The motor mounting portion 28 has a pair of slots 34 each of which has an enlarged, peripheral portion 35 that extends through the vertical portion 31 to a narrow, inboard portion 36 that extends through the horizontal portion 32. The horizontal portion 32 also includes a recess or groove 37 positioned about each narrow portion 36. Each slot 34 is configured to allow the passage of the post head 18 through the enlarged portion 35 and the post stem 17 into the narrow portion 36.

The blade mounting portion 29 of the blade iron has a pair of guide pins 41 extending above a peripheral, top edge 42, a rubber dampening plate 43 having protrusions 44 configured to nest upon the guide pins 41, and a securing plate 45 mounted for pivotal movement through a mounting bolt 46. The securing plate 45 has a pair of oppositely facing catches 48 and an elongated tab 49 sized and shaped to be received within a notch 51 extending from the top edge 42 of the blade iron. Each catch 48 has an upright portion 53 and an overhanging portion 54. The securing plate 45 is pivotal between a blade unlocked position, shown in Fig. 5, and a blade locked position, shown in Fig. 6.

Each blade iron 27 is coupled to a ceiling fan blade 56. Each ceiling fan blade 56 has a pair of mounting holes 57 and a pair of guide holes 58. The mounting holes 57 are sized and shaped to receive the blade iron catches 48. The guide holes 58 are sized and shaped to receive the dampening plate protrusions 44. The thickness of the blade 56 is such that the blade fits snugly between the top edge 42 of the blade iron and the overhanging portion 54 of the catch 48.

In use, with the securing plate 45 is in its unlocked position, the blade 56 may be quickly attached to the blade iron 27 by passing the securing plate catches 48 through the blade mounting holes 57 and passing the dampening plate protrusions 44 through the blade guide holes 58. An operator then grasps the elongated tab 49 and therethrough rotates the securing plate 45 to its locked position, shown in Fig. 6. With the securing plate 45 in its locked position the catches upright portions 53 abut the side walls of the mounting holes 57 and the overhanging portions 54 are pressed against the top surface of the blade 56. As such, the catches capture the blade and prevent any blade movement relative to the blade iron. The positioning of the protrusions 44 within the guide holes 58 prevent relative movement between the blade 56 and the blade iron 27. Of course, the dampening plate 43 is utilized to minimize vibration and noise between the blade and the blade iron. The securing plate 45 is prevented from moving back towards its unlocked position by the positioning of the elongated tab 49 within the notch 51. Of course the securing plate may be manually moved back to its unlocked position by lifting and flexing the tab 49 upwards and out of the notch 51 should it be desired to later remove the blade from the blade iron.

The operator may then mount the blade iron 27 to the motor lower portion 12 by guiding the blade iron so that the slots 34 are aligned with the posts 16. The blade iron 27 is then moved in an outboard direction so that the blade iron horizontal portion 32 is forced into the space between the spring first leg 21 and the spring second leg 22, as shown in Fig. 3. The blade iron is in its final position when the stops 24 spring upwards and abut the inboard side of the horizontal portion 32, as shown in Fig. 4, to prevent the inboard movement of the blade iron relative to

the motor. The biasing force of the springs 19 capture securely the blade iron motor mounting portion 28 and thereby couple the blade iron to the motor.

5 The blade iron motor mounting portion 28 may include a recess or groove 61 sized and shaped to receive a portion of the spring stops 24 in order to provide flush mounting of the blade iron against the motor lower portion 12.

10 It thus should be understood that the blade may be quickly and easily mounted to the blade iron. Similarly, it should be understood that the blade iron may be quickly and easily mounted to the motor with a single outboard movement of the blade iron.

15 It should also be understood that the present invention is not limited to use with ceiling fans, and may be utilized with any type of fan.

It should also be understood that all references to the directional terms such as vertical, horizontal, upright and the like are for illustrative purposes only with reference to the drawings.

20 It thus is seen that a blade iron is now provided which may be mounted quickly and easily and thus overcomes problems with those of the prior art. While this invention has been described in detail with particular references to the preferred embodiments thereof, it should be understood
25 that many modifications, additions and deletions, in addition to those expressly recited, may be made thereto without departure from the spirit and scope of the invention as set forth in the following claims.